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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/838,219

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Akinari Takagi

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08/13/2002

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EXAMINER

SANDERS JR., JOHN R

ART UNIT

PAPER NUMBER

3737

DATE MAILED: 08/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/838,219

Applicant(s)

TAKAGI ET AL. *OK*

Examiner

John R. Sanders

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Inventorship

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. The abstract of the disclosure is objected to because it is longer than 150 words. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

4. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2002/0034016 A1 to Inoguchi et al. Inoguchi discloses an image observation apparatus (FIG. 4) comprising an image display means and a display optical system for projecting the image onto the retina (paragraph 12). Inoguchi also discloses a control means for changing the incident beam position. This is in the form of the reflective LCD device (2), which acts as a spatial light modulation element. The LCD device is capable of changing the incident beam position by only illuminating certain sections at a time (FIG. 17). Also, by changing the image respectively, the control means is in accordance with the desired image information.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 3737

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The applied reference has a common assignee with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

6. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoguchi in view of the publication "Final outcome reports of advanced stereoscopic motion picture communication project" issued by Telecommunications Advancement Organization of Japan. Inoguchi does not disclose separating the exit

Art Unit: 3737

pupil into separate regions selectively imaged by the image display and the optical system. By the applicant's own admission of the relevant background art, the aforementioned publication discloses this practice. It would have been obvious to one of ordinary skill in the art to use such a method for a parallax image display system in order to project parallax images to different regions of the eye's entrance pupil. Also, It would have been obvious to one of ordinary skill in the art to make the peripheral regions larger to compensate for the greater corneal refraction at the edges of the pupil. It is inherent in image viewing systems to have the incident light only correspond to the pupillary region (whether by altering the diameter of the incident light with optics or altering the direction of the light with a spatial light modulator) since light not shone through the pupil is not seen by the observer. The applicant is requested to submit a copy of the cited publication for the record.

7. Claims 3, 4, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoguchi and further in view of U.S. Patent No. 5,610,673 to Rafal et al. Regarding claims 3 and 16, Inoguchi does not disclose a pupil position detection means. Rafal teaches a pupil detection system (FIG. 1).

Regarding claims 4 and 17, Inoguchi does not teach the use of an infrared illumination means and a light-receiving device. Rafal teaches an infrared illumination means and an image capture component in an eye tracking apparatus (Rafal, claim 1). It would have been obvious to one of ordinary skill in the art to include these components in an apparatus designed to alter the position of a light beam on the eye in

Art Unit: 3737

order to affect a change in the position of the beam in accordance with the location of the pupil and to illuminate the eyeball for observation and image capture.

8. Claim 18, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art applied to claim 21 and further in view of U.S. Patent No. 6,094,241 to Yamakazi et al. Regarding claim 22, the aforementioned art does not disclose a plurality of light sources illuminating a display means on a time-division basis.

Yamakazi teaches a plurality of light sources in such an arrangement. It would have been obvious to one of ordinary skill in the art to use such an arrangement with a spatial light modulator (LCD screen) to illuminate selective regions of the exit pupil as disclosed in the publication "Final outcome reports of advanced stereoscopic motion picture communication project". Also, Inoguchi discloses a unit light source array (paragraphs 49 and 126). It would have been obvious to one of ordinary skill in the art to include such an array in an imaging device.

9. Claims 5 to 13, 19, 20, and 23 to 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claims 1 to 4, 14 to 17, 18 and 22 above and further in view of U.S. Patent No. 6,377,295 to Woodgate et al. Regarding claims 5, 7, 11, 13 and 27, Inoguchi discloses a display illumination means comprising a reflective spatial light modulator in the form of an LCD device (paragraph 2) which alters the incident light position as described above.

Art Unit: 3737

Regarding claims 8, 19 and 23, Inoguchi discloses a light emitting element array (paragraphs 49 and 126).

Regarding claim 10, Inoguchi discloses a point source illumination means (paragraph 176).

Regarding claims 6, 9, 12, 20, 24 and 26, Inoguchi does not disclose a transmissive spatial light modulator or an illumination means comprising a surface illuminant and a spatial light modulator. Woodgate teaches a backlit LCD display which inherently must be transmissive to allow light from behind it to pass through to the optical system (column 3, lines 30-32). This spatial light modulator comprises a 2D pixel structure (column 6, lines 9-16). It would have been obvious to one of ordinary skill in the art to include these image display limitations in order to affect different light source/spatial light modulator arrangements in different embodiments of an image display optical system.

Regarding claim 25, it would have been obvious to one of ordinary skill in the art to include a viewing apparatus such as an eyepiece in order to observe the image display.

10. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claims 1 to 4 and 14 to 17 above. Regarding claim 28, Inoguchi discloses a prism with the limitations described in the claim (paragraph 6 and FIG. 4). It would have been obvious to one of ordinary skill in the art to use such a

Art Unit: 3737

prism in an image display device in order to affect a plurality of incident parallax views on the eye (FIG. 7).

Regarding claim 29, it would have been obvious to one of ordinary skill in the art to have one display device for each eye in order to have a stereoscopic view.

Conclusion


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cleveland discloses an eye tracking method. Tabata discloses a virtual image display device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John R. Sanders whose telephone number is (703) 305-4974. The examiner can normally be reached on M-F 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin M. Lateef can be reached on (703) 308-3256. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3590 for regular communications and (703) 308-0758 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0858.



jrs
August 9, 2002



George Manue
Primary Examiner